Exhibit A

REPORT OF ERIK JOHNSON

Ila LaFrentz, Jim LaFrentz, Katherine Porterfield and William LaFrentz, Individually and as Representatives of the Estate of James B. LaFrentz vs. 3M Company, et al.

This report includes my opinions relating to the case Ila FaFrentz, Jim LaFrentz, Katherine Porterfield and William LaFrentz, Individually and as Representatives of the Estate of James B. LaFrentz vs. 3M Company, et al. My opinions are based on my education, years of experience in industrial hygiene, and my work with personal protective equipment including respirators. This includes various OSHA standards such as 29 CFR 1910.134 (respiratory protection), 29 CFR 1910.100 (asbestos), 29 CFR 1910.1025 (lead), proceedings and final rule on Assigned Protection Factors, etc.; NIOSH standards 30 CFR 11 and 42 CFR 84 (respirators); and ANSI Z88.2 (respirators). I have also reviewed the 3M 8500 and 8710 advertising, packaging, user instructions, laboratory testing, qualitative and quantitative fit testing, workplace testing, and other related documents. In addition, this report is based on my review of the following documents:

1. *Deposition transcript of James LaFrentz, taken 11/14/2018;*
2. *Deposition transcript of James LaFrentz, taken 11/15/2018;*
3. *Exhibits to the depositions of James LaFrentz;*
4. *Plaintiffs' Third Supplemental Rule 26(A) Disclosure;*
5. *Expert Report of Darell Bevis;*
6. *Expert Report of Ken Garza;*
7. *Plaintiffs' Second Amended Complaint*

I have a Bachelor's degree in physics from St. Olaf College in Northfield, MN (1991). I worked as an intern and tech aide in the 3M Occupational Health and Environmental Safety Division assembling and testing prototype respirators and filter material (1991-1994). My Master's degree is in Industrial Hygiene from the University of Minnesota (1994). I have worked as a tech service representative in OH&ESD (now 3M Personal Safety Division) from 1994 to the present. In that role I have been responsible for disposable, reusable, powered and supplied air respirators; respirator selection guides and software programs; diffusion and electronic gas/vapor monitors; technical writing and training; and Asia/Pacific region for most of the OH&ESD/PSD products. I am a certified industrial hygienist (1994) and certified safety professional (2017).

My testimony in this case may include a variety subjects including the design, development, testing and effectiveness of respirators manufactured by 3M and allegedly worn by Mr. LaFrentz. It is my opinion that 3M respirators including the 3M 8710 are safe and effective when properly selected, fitted, worn, maintained/disposed, etc. according to relevant standards, regulations and industrial hygiene principles.

Referring to the 8710 as a "paper mask" is incorrect. It consists of an inner shell, a non-woven polypropylene filter media and a coverweb. None of the three layers are paper.

The 8710 was developed in the late 1960s to early 1970s. 3M worked in conjunction with Dr. Irving Selikoff (Mount Sinai School of Medicine), the International Association of Heat and Frost Insulators and Asbestos Workers and others to develop disposable particulate respirators that were easier to breathe through and more consistently worn than elastomeric respirators.

The 8710 was approved May 24, 1972 by the US Bureau of Mines as a single use dust respirator under 30 CFR 11. It was approved for respiratory protection against pneumoconiosis and fibrosis producing dusts, including but not limited to aluminum, asbestos, coal, flour, iron ore or free silica (TC-21C-132). The approval was later extended by the US National Institute of Occupational Safety and Health (NIOSH) to also include dusts and mists not having an exposure limit less than 0.05 mg/m^3. 3M continually maintained the NIOSH approval on the 8710 through 1998, when the product was discontinued due to revised NIOSH regulations 42 CFR 84.

Extensive testing has been done over the years to demonstrate that the 8710 can filter various types of particles, including submicron aerosols. Laboratory testing has been done against silica dust, asbestos fibers, sodium chloride, DOP and lead dust. 3M testing showed that the 8710 had high filtration efficiency against silica dust in both the unloaded (new) and loaded state. Testing done at the University of Minnesota demonstrated the ability of the 8710 to filter particles of various sizes (including particles <0.1 µm) and at different flow rates. The U of MN authors also noted that the 8710 had both lower penetration and breathing resistance than a similar respirator from a different manufacturer.

The mass median diameter of particle distributions in industrial workplaces is predominantly larger than the aerosols used to test respirators. Thus, filtration efficiency in workplaces would be higher than seen in most laboratory testing. Put another way, most occupational exposure limits for dusts are expressed as mass per volume of air (mg/m^3). Larger particles have more mass and are easier to filter. Therefore, particulate respirators such as the 8710 filter workplace aerosols to help reduce exposure commensurate with relevant occupational exposure limits. Occupational asbestos exposure is measured as fibers per cubic centimeter of air (f/cc), but only fibers longer than 5 µm are counted. These sized fibers are efficiently filtered by particulate respirators such as the 8710.

I expect to testify that although fit test terminology and methods have changed over time, there has always been a fit test method for 8710 users that met relevant standards and regulations. In the 1960s and 70s, none of the respirator fit test methods were validated similar to today's practices. In the ANSI Z88.2-1969 standard for respiratory protection, users were advised to check the fit each time the respirator is put on by following the manufacturer's instructions and then lists examples such as the positive pressure and negative pressure test.

The 8710 packaging contained information, instructions, and warnings that were appropriate for their time. Similar to the positive pressure test listed above, the 8710 packaging contained instructions on how to put the respirator on, mold the noseclip, adjust the straps, check the fit by exhaling vigorously and readjusting if leaks were detected. In 1976 and 1978, the US National Institute for Occupational Safety and Health (NIOSH) listed negative and positive pressure tests as qualitative fit test methods.

In the ANSI Z88.2-1980 standard for respiratory protection, optional qualitative fit tests included using a stream of coal dust, talcum powder or fluorescein liquid particles. One validation of the donning and fit may be seen in 8710 prototypes worn in a coal dust test chamber with no visible leakage. In the 1980s 3M developed a "large particle" quantitative fit test to allow quantitative fit testing of dust/mist and

dust/fume/mist respirators. This advancement in technology led to research indicating that the positive pressure fit check used with disposable respirators such as the 8710 was effective in detecting poor fits.

In section (e)(5) of the original OSHA standard for respiratory protection 29 CFR 1910.134, it is stated that "Training shall provide the men an opportunity to handle the respirator, have it fitted properly, test its face-piece-to-face seal, wear it in normal air for a long familiarity period, and, finally to wear it in a test atmosphere." But at that time the purpose of the "test atmosphere" was not defined. Nor were specific fit test methods listed. In 1980 OSHA issued a "Federal Program Change" memo indicating that wearing respirators in a test atmosphere was for assessing respirator fit using recognized qualitative or quantitative fit methods. About the same time, the ANSI Z88.2-1980 standard and subsequent revisions began to define qualitative fit tests as using a test agent that is filtered by the respirator being tested.

3M developed the saccharin aerosol fit test method circa 1980. It was designed for fit testing various types of particulate respirators including the dust/mist, dust/mist/fume and HEPA classes. The saccharin method was validated by Los Alamos National Laboratory, Lawrence Livermore Laboratory, DuPont and 3M. It was later included by OSHA in standards such for lead and the updated standard for respiratory protection. Later, 3M developed the Bitrex™ aerosol qualitative fit method which was also included in the revised OSHA standard for respiratory protection.

Laboratory based "respiratory protection factors" have done on various types of respirators worn by people exposed to aerosols of various types and sizes. However, these tests may not be applicable to workplace performance as will be described.

Ed Hyatt (Los Alamos National Labs) used submicron aerosols, subjects of different facial sizes, and exercises of 1) normal breathing, 2) deep breathing, 3) turning head slowly form side to side, 4) moving head up and down and 5) talking. Respirators tested were described in his report as approved under the earlier Bureau of Mines Schedule 21B, which would not include the 3M 8710 (approved under 21C). However, in separate report, Hyatt identifies the 8710 as respirator "I" in table D. Based on his data, Hyatt assigned single use dust respirators a protection factor of 5 (assuming they are used in a respirator program that meets the OSHA standard 1910.134). However, Hyatt states that if also tested against asbestos or cotton dust, these respirators could be assigned a 10 for those particulates. Because the 8710 was tested against asbestos, it is appropriate to give it a protection factor of 10 when used against asbestos according to Hyatt.

It should be noted that Hyatt used particles with a mass median aerodynamic diameter (MMAD) of about 0.6 μm. This is about 1/6 of the size of the silica dust test used for respirator certification: 0.4-0.6 μm, count based. (For the same aerosol size distribution, mass based diameters are larger than count based diameters.) Therefore, much of the penetration observed would have been from filter penetration instead of face seal leakage. Most workplace aerosols are much larger, and therefore the protection factors in workplaces would be higher. 3M repeated Hyatt's work using modified versions of the 8710 with higher filter efficiency to minimize filter penetration (similar to what would be seen in workplaces) and saw protection factors of 18-52.

In contrast to laboratory testing, workplace protection factor (WPF) testing measures performance in the workplace for of a respirator that has been properly selected, fitted, used and maintained. These has been much discussion on the proper protocol including worksite selection, sampling procedure, data

analysis, etc. WPF testing on 8710 has included silica in a foundry, asbestos removal, asbestos exposure in manufacture of truck brakes, an alkaline battery plant, a steel mill and a lead battery plant.

Additionally, Thomas Nelson reviewed data from several workplace protection factor studies for various half mask respirators and concluded that disposable dust/mist respirators (including the 8710) had protection factors with a geometric mean of 224 and a lower 5^{th} percentile of 22.4. He also concluded that there was no significant difference in performance between reusable and disposable half mask respirators.

I expect to testify regarding applicable regulations related to asbestos. In 1971 (prior to the introduction of the 8710), OSHA allowed negative pressure reusable or single use respirators for asbestos exposures up to 5 times the exposure limit. In 1972, OSHA stated that these same respirators, which included the 8710, could be used for asbestos exposure up to 10 times the exposure limit. In 1986 OSHA revised the asbestos standard and required as a minimum half facepiece respirators with high efficiency filters. However, in the preamble to the standard, "OSHA notes that the testing of respirator effectiveness for asbestos (the LASL and DuPont studies) suggest that certain respirators within a class appear to perform better than other respirators within the same class. For example, the 3M 8710 appears to provide better protection than the other respirators in its class as a single-use respirator."

The ANSI Z88.2-1969 standard for respiratory protection did not contain numerical protection factors, but rather general guidance for respirator selection. The 1980 and 1992 versions of the ANSI Z88.2 standard have half mask air purifying respirators, including the 8710, listed with a protection factor of 10.

OSHA published its "Assigned Protection Factors; Final Rule" in 2006. Most of the data is based on respirators approved under 30 CFR 11, including the 8710. After reviewing the data, OSHA concluded that half mask air purifying respirators, including the 8710, have an assigned protection factor of 10. This means that when used in an OSHA compliant respirator program, half mask air purifying respirators such as the 8710 would reduce inhalation exposure by at least a factor of 10 (or 90%).

I will testify that it is the employer's responsibility to ensure that respirators used in workplace are part of a compliant respirator program. The ANSI Z88.2 and OSHA standards such as 29 CFR 1910.134 list components of an acceptable respirator program including:

- Program administrator
- Written procedures
- Exposure monitoring
- Using engineering controls to minimize exposure
- Proper respirator selection based on the hazards
- Employee training in proper respirator use and limitations
- Fit testing of respirators
- Respirator cleaning, inspection, maintenance and storage
- Medical evaluation
- Regular determination of program effectiveness

It is critical that respirators are worn during the entire time of exposure. Lack of visible dust does not indicate absence of a respirable hazard. If a respirator is removed for any reason during exposure, then the user will be fully exposed during that time.

The 8710 helps reduce respiratory exposure when used according to OSHA standards and industrial hygiene principles. It is my opinion that the 3M 8710 respirators used by James LaFrentz were not defective in any manner. If asked about the 3M 8500, I will testify that it was for non-toxic dusts.

Based on the documents provided to me in this case, Mr. LaFrentz was potentially exposed to asbestos in the early 1960s during cleanup of construction sites and removing pipes from the basement of an abandoned hospital. Even though these were dusty applications, he does not recall wearing a respirator. He also performed brake and clutch work over several years.

From 1978-1981 Mr. LaFrentz worked for General Dynamics at the Carswell Air Force Base where he drilled, sanded and deburred coupons (strips and panels) for testing. Each coupon took approximately 15-40 minutes. Mr. LaFrentz indicated that he did this work intermittently (e.g. 1 or 2 days a month) but processed at least 1000 coupons over the 3 year period. He would also clean up his station with a small broom and compressed air hose. There was no local exhaust ventilation and they were not allowed to wet the material to keep down the dust levels.

LaFrentz testified that respirators were not required by General Dyamics for his work. He was not aware of the materials or composition of the coupons. After a period of time, he "told the parts guy that...I needed a dust mask for all that dust." He claims to have been given the 3M 8710 but did not receive any training on the use or fitting. LaFrentz never saw any advertisement, literature, warnings or instructions for the 3M 8710.

He complained about the dust levels and smell to his supervisor, but no changes were made. On 2/26/80 a one minute air sample taken while Mr. LaFrentz was "Belt Sanding P 653 Panels" indicated 28.8 asbestos fibers/cc. This was above the 10 f/cc ceiling limit, but the safety engineer made no comments about the results or his respirator, and no changes were made. LaFrentz claims that at that time he didn't know what asbestos was or the associated health hazards. He doesn't recall discussion of asbestos at weekly safety meetings.

Other OSHA standards and good industrial hygiene practice dictate that employees must be trained on workplace hazards and their potential health effects. OSHA, NIOSH and other groups have published mandatory requirements and/or best practices for controlling worker exposure to asbestos, silica, coal dust and many other substances. Based on the documents provided to me, neither hazard communication, exposure control methods nor a respiratory protection program were properly implemented.

If additional depositions are taken, other experts raise issues or additional information becomes available, I may offer other opinions if they are within my scope of expertise and practice. This may include review of additional materials and documents.

QUALIFICATIONS AND PUBLICATIONS: A copy of my curriculum vitae is attached, which lists my qualifications and publications.

TESTIMONY: A list of cases in which I have testified as an expert at trial or by deposition during the last four years is attached.

COMPENSATION: I am not being compensated beyond my normal salary.

Erik W. Johnson

8/12/20

Date

Deposition and Trial Testimony of Erik Johnson, C.I.H.

Testimony:	Expert/30(b)6	Date:	Case:
Deposition	Expert	8/13/2020	*Larry L. Roemmich and Gloria Roemmich, Husband and Wife* Case No. 20-2-00926-1-KNT Superior Court of Washington, King County
Deposition	Expert	1/24/2020	*Alfred M. Burton v. 3M Company, et al.* *Case No. 19-2-17070-1-KNT* *Superior Court of Washington for King County*
Deposition	Expert	8/29/2019	*Valerie Jean Culver, as Personal Representative of the Estate of Robert D. Larson, Deceased, and Bessie Larson v. 3M Company, et al.* Case No. 18-2-03806-5-SEA Superior Court of Washington, King County
Deposition	Expert	8/28/2019	*Wayne Wright, Individually and as Personal Representative for the Estate of Warren Wright, Deceased v. 3M Company et al.* Case No. 18-2-03806-5-SEA Superior Court of Washington, King County
Deposition	30(b)6	5/31/2019	*Robert Miller and Janice Miller v. 3M Compan* Case No: 2-18-cv-00510-JAW USDC, District of Maine
Deposition	Expert	4/29/2019	*Randolph Morton and Edna Morton v. 3M Company* Case No. 702643 Superior Court of the State of California, County of Los Angeles
Deposition	Expert	2/21/2019	*Richard W. Lewis and Diane J. Lewis v. 3M Company, et al* Case 18-2-09747-4 Superior Court of Washington for Pierce Cou
Deposition	Expert	1/29/2019	*Terry Coleman, et al., v. 3M Company* *Case No. 16-CI-238* *David Allen, et al., v. 3M Company* *Case No. 16-CI-159* Knott County Circuit Court
Trial	Expert	12/14/2018	*Ida McCarthy, as Personal Representative of the Estate of Gerald T. McCarthy* Case No. 15-5621 Commonwealth of Massachusetts, Middlesex Superior Court
Deposition	Expert	11/1/2018	*Ida McCarthy, as Personal Representative of the Estate of Gerald T. McCarthy v. 3M Company* Case No. 15-5621 Commonwealth of Massachusetts, Middlesex Superior Court
Deposition	Expert	8/29/2018	*Richard Adams (Gaddy Hall) v. 3M Company* Case No. 15- CI-00310 Commonwealth of Kentucky, Letcher Circuit Court
Deposition	30(b)6 (Confidential)	11/28/2017	*Jackie D. Earls Jr., and Donna Earls v. 3M Company* Case No. 10-010111 In the Court of Common Pleas of Allegheny County, Pennsylvania

*Erik Johnson is an employee of 3M Company, there is no charge for his testimony.

ERIK JOHNSON, MPH, CIH, CSP

Erik Johnson is a Technical Service Specialist with the Personal Safety Division of 3M Company. He has worked for the past 25 years with this Division. His current responsibilities include product development and stewardship, technical writing, and public speaking. Previously his focus was technical service for the Asia/Pacific region.

Erik holds a Bachelor of Arts Degree in Physics from St. Olaf College in Northfield, Minnesota and a Masters Degree in Public Health with emphasis in Industrial Hygiene from the University of Minnesota. He is a certified industrial hygienist and certified safety professional.

PUBLICATIONS:

Checky M, Frankel K, Goddard D, Johnson E, Thomas JC, Zelinsky M, Javner C. "Evaluation of a passive optical based end of service life indicator (ESLI) for organic vapor respirator cartridges." J Occup Environ Hyg. 2016; 13(2):112-20. 2016

Cho, H., Yoon, C. Lee, J., Lee, S., Viner, A. Johnson, E. "Comparison of Pressure Drop and Filtration Efficiency of Particulate Respirators using Welding Fumes and Sodium Chloride." *Ann. Occup. Hyg* 55(6): pp. 666-680, 2011.

Reponen, T., Lee, S., Grinshpun, S. Johnson, E., McKay, R. "Effect of Fit Testing on the Protection Offered by N95 Filtering Facepiece Respirators Against Fine Particles in a Laboratory Setting." *Ann. Occup. Hyg* 55(3): pp. 264-271, 2011.

G. Ramachandran, E.W. Johnson and J.H. Vincent "Inversion Techniques for Personal Cascade Impactor Data." *J. Aerosol Sci.* 27, 1083-1097, 1996.

PRESENTATIONS:

E.W. Johnson. "Construction Silica Competent Person" Various locations. 2017.

E.W. Johnson "A Breath of Fresh Air: OSHA Respirator Standard 29 CFR 1910.134" ASSE, Denver, 6/22/2017

E.W. Johnson "PAPR Cartridge Service Life Against Hydrogen Peroxide and Peracetic Acid" AIHCE, Seattle 6/5/2017

E.W. Johnson "Permeation and Respiratory Protection", AIHA, State College PA 4/6/2016

E.W. Johnson "Developing Respirator Cartridge Change Schedules" AIHA webinar 3/10/2015

E.W. Johnson "Carbon Loaded Disposable Respirators: Intended Use and Capabilities" American Industrial Hygiene Association and Exposition, San Antonio, TX, 2014.

E. W. Johnson "Respirator Cartridges and Filters: How Do They Do What They Do" Voluntary Protection Programs Participants' Association, Nashville TN, 2013 and Washington DC, 2014.

E.W. Johnson "Respiratory Protection for Healthcare Workers" Occupational Safety + Health Asia, Singapore, 2008.

E.W. Johnson "Respiratory Protection and Engineered Nanoparticles" Occupational Health & Safety Industry Group, Auckland, New Zealand, 2008.

E.W. Johnson "Filtration Efficiency of Surgical Masks and Particulate Respirators Against Biological Aerosols" International Society for Respiratory Protection, Toronto, Canada, 2006.

E.W. Johnson "Long Term Diffusive Sampling: Literature Review and Testing" American Industrial Hygiene Association and Exposition, San Diego, CA, 2002.

E.W. Johnson and L.A. Brey. "Prediction of the Effect of High Relative Humidity on Organic Vapor Cartridge Performance" American Industrial Hygiene Association and Exposition, New Orleans, Louisiana, 2001.

E.W. Johnson and L.A. Brey "Prediction of Respirator Cartridge Service Life Against Organic Vapors at Workplace Concentrations" American Industrial Hygiene Association and Exposition, Atlanta, Georgia, 1998.

E.W. Johnson, D.J. Larsen and R.A. Weber. Performance Evaluation of Organic Vapor Diffusion Monitors. Presented at the American Industrial Hygiene Conference and Exposition, Washington D.C., 1996.

D.J. Larsen and R.A. Weber and E.W. Johnson. Storage Characteristics of Exposed Activated Carbon Diffusion Monitors. American Industrial Hygiene Conference and Exposition, Washington D.C., 1996.

E.W. Johnson. Respiratory Protective Devices. Filtration '95 International Conference & Exposition, Chicago, IL. 1995.

E.W. Johnson. Laser Surgery Plume as a Particle Source. American Filtration Society, Minneapolis, MN, 1994.

E.W. Johnson and J.H. Vincent. A Study of Two Personal Cascade Impactors and Their Potential for Application in Health-Related Aerosol Exposure Assessment. Fourth International Aerosol Conference, Los Angeles, CA, 1994.

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Erik Johnson is a Technical Service Specialist with the Personal Safety Division of 3M Company. He has worked for the past 25 years with this Division. His current responsibilities include product development and stewardship, technical writing, and public speaking. Previously his focus was technical service for the Asia/Pacific region.

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